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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,364	02/27/2006	Jin-Suk Lee	ASIAP022.US01	3081

45965 7590 04/01/2009

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EXAMINER	
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ART UNIT	PAPER NUMBER
1621	

MAIL DATE	DELIVERY MODE
04/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,364	LEE ET AL.	
	Examiner	Art Unit	
	YATE' K. CUTLIFF	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12 and 14-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-12 and 14-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/21/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1, 3 – 12 and 14 - 34 are pending.

Claims 2 and 13 have been canceled

Claims 1, 3 – 12 and 14 - 34 are rejected.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on November 21, 2008 was filed after the mailing date of the First Office Action on the merits. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The drawings were received on November 21, 2008. These drawings are acceptable and are entered.

Response to Amendment

4. The amendment to claims 1 and 11, and new claims 22-34, submitted November 21, 2008 is acknowledged and entered.

Response to Arguments

5. Applicant's arguments, see pages 8-10, filed November 21, 2008, with respect to the rejection(s) of claim(s) 1, 3 – 12, and 14 - 21 under 35 U.S.C. 103(a) have been fully considered and are persuasive in view of the amendments to the claims and the arguments put forth. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Sucher & Holzer

Bauplan Handel (AT 406870B) (Sucher), in view of Peter et al. (WO 03/004591; US 6,933,398), in view of Lever Brothers & Unilever Limited (GB 612,667) (Lever), in view of Peterson et al. (JAOCS, Vol. 61, 1984), and further in view of Foidl (US 5,939,571), as set out below.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 22, line 6 discloses the structure R_1COOR, wherein R and R_1 are independently selected, and R is an alkyl group form 1 to 10 carbons. However, there is not disclosure for R_1, therefore the final structure of the reaction product R_1COOR is not clearly set forth.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1, 2-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over of Sucher & Holzer Bauplan Handel (AT 406870B) (Sucher), in view of Peter et al. (WO 03/004591; US 6,933,398), in view of Peterson et al. (JAOCS, Vol. 61, 1984), and further in view of Foidl (US 5,939,571), as set out below. (Note that for Peter et al. all citations will be to the US patent which is the English language of the foreign reference)

13. The rejected claims cover, inter alia, a method of producing a bio-diesel oil comprising transesterifying oil/fat with alcohol in a reaction mixture comprising an alkyl ester, wherein the alkyl ester is created as a product of the reaction mixture and is refluxed back to the reaction mixture to function as a subsidiary solvent that promotes homogenous mixing of the reaction mixture. The dependent claims disclose the type of

fat or oil used as feed stock, the type of alcohol, the ratio of alcohol to oil, the catalyst type and the type of rector.

14. Sucher discloses a process for producing a fatty acid alkyl ester by transesterification of triglycerides with an alcohol in the presence of a basic catalyst and is characterized by a combination of the following steps: (1) the triglyceride is mixed with the alcohol and catalyst and converted to form two fluid phases, namely, a crude ester phase and a glycerin phase; (2) the two fluid phases are separated; (3) the crude ester phase is divided into two portions (A) and (B); (4) portion (A) is purified, producing substantially pure fatty acid alkyl ester; (5) portion (B) is mixed with more triglyceride for transesterification, more alcohol and more catalyst and converted to form two further fluid phases, namely, a crude ester phase and a glycerin phase; steps (2) - (5) are then repeated. (abstract). The catalyst used in Sucher is a homogeneous catalyst which can be basic or acidic; the oil/fat can be selected from a vegetable oil or animal fat; the alcohols can be methanol of ethanol, and the process can be continuous. (see English translation (Eng. Trans) pages 2 & 3). The process of Sucher is a continuous process. (see Eng. Trans. Page 2, next to last sentence). Additonally, according to Sucher the reaction product, crude ester portion (B), when recycled back into the transesterification phase, the amount of alcohol and catalyst are lowered by enrichment of the reaction with the reaction product crude ester (B). (see ENG. Trans. page 3, para. 5). Further, the last two paragraphs on page 3 of the Eng. Trans. discuss the benefits of recycling a portion of reaction produce crude ester (B) back into the transesterification process that is continuous.

Sucher fails to disclose: that the alkyl ester functions as a subsidiary solvent that promotes homogeneous mixing; the percentage range of alkyl ester put back into the reaction mixture; and the use of a heterogeneous catalyst.

15. However, Peter et al. is a process for obtaining fatty acid esters from triacylglycerides and recognizes that in a transesterification process there is a low reaction rate because the alkanol reaction component is not soluble in the oil. It is stated in Peter et al. that methanol is readily soluble in methyl ester. (see column 1, lines 66-67 to column 2, lines 1-7). The process of Peter et al. uses alkanol fatty acid esters such as, methyl esters, ethyl esters and/or propanol esters, before, during or at the same time as addition of alcohol in the reaction process to accelerate the transesterification reaction, which is caused by the formation of a one phase reaction mixture. (see column 2, lines 33 – 38 & 50 - 54). The alkyl esters of Peter et al. are added in a quantity of 5 to 50 wt.% based on the fat and/or oil. (see column 3, lines 19-21). Specifically, the alcoholysis process of Peter et al., is carried out by using methanol, and adding a portion of the continuously produced ethyl esters to the triacylglyceride starting product in quantities such that the mixture of oil methanol and methyl esters consist of one reaction phase. (column 2, lines 60-64). Further, Peter et al. discusses recirculating alkanol fatty acid esters remaining after the reaction as part of a continuous operation. (see column 3, lines 57 - 67). Peter et al., without specifically stating such, is using the esters as solvent for the transesterification reaction process. Furthermore, based on the general discussion in Foidl, it was known at the time of Applicant's claimed process that esters once formed in a transesterification

reaction between a triglyceride (fat/oil), alcohol and catalyst turn the initial biphase reaction into a homogeneous phase prior to the formation of the glycerin. (see column 3, lines 4-9).

It was known in the art that at the time of Applicant's claimed process that the addition of an alkyl ester into a transesterification reaction involving a fat and/oil would create a homogeneous reaction phase as disclosed by Foidl. Further, from the teaching of Peter et al. it is known that a homogeneous reaction phase, (one reaction phase) is formed when a portion of the continuously produced ethyl esters is added to the triacylglyceride starting product before, after or at the same time the alkanol is added to the reaction.

Applicant's claimed process of producing bio-diesel oil (basically fatty acid methyl ester) by transesterification of oil/fat is disclosed by the combined teachings of Sucher and Peter et al., where each disclose that the addition of an alkyl ester product to the transesterification reaction offers an improvement to the reaction process. Foidl discloses that it was known that once the ester forms in the transesterification process a homogenous phase will exist. As such even though Sucher and Peter et al. do not specifically state the existence of a homogeneous phase, however, one of ordinary skill in the art would recognize the formation of the homogeneous phase because Foidl states that it was know to form. The only differences between the clamed invention and the references are the combination and order of the "old refining steps for the spent methanol and crude methyl ester" in the processing sequence. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to

prepare a biodiesel as suggested by Sucher and add the additional step of adding alkyl ester from the reaction mixture as suggested by Peter et al. to promote homogeneous mixing of the reaction mixtures.

Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S. ___, 82 USPQ2d 1385 (U.S. 2007).

16. With regard to the use of a heterogeneous catalyst, Peterson et al. discloses that heterogeneous catalyst such as set out in Table II with catalyst activity set out in Table III. The reaction process used catalyst concentrations of 0.3-0.5% based on the weight of the vegetable oil. (see page 1593, column 2, first full paragraph). Peterson et al. teaches the use of heterogeneous catalyst in a transesterification process for the production of diesel fuel.

The only remaining differences are the use of a batch reactor, a plug flow reactor or the use of a plurality of reactors. Each of these features is an old element common to the industrial transesterification process. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to prepare a biodiesel as suggested by Sucher in view of Peter et al. and further in view of Peterson et al. to produce a bio-diesel oil.

Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no

change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S., 82 USPQ2d 1385 (U.S. 2007).

With regard to any remaining limitations not disclosed in the prior art are deemed to be within the purview of an ordinary artisan. These limitations are deemed to be obvious absent a showing of unexpected results.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. *(In reOpprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35USC 103(a). From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

17. Claims 11, 12 and 14 – 21are rejected under 35 U.S.C. 103(a) as being unpatentable over Sucher & Holzer Bauplan Handel (AT 406870B) (Sucher), in view of Peter et al. (WO 03/004591; US 6,933,398), in view of Lever Brothers & Unilever Limited (GB 612,667) (Lever), in view of Peterson et al. (JAOCS, Vol. 61, 1984), and further in view of Foidl (US 5,939,571), as set out below.

18. The rejected claims, cover inter alia, a method of producing a bio-diesel oil, comprising: (a) pre-esterifying a free fatty acid, contained in oil/fat, with an alcohol in the presence of an acidic catalyst to create a reaction mixture comprising an alkyl ester; and (b) transesterifying the reaction mixture to create a product comprising the alkyl ester, wherein the alkyl ester is refluxed back to the reaction mixture to function as a subsidiary solvent that promotes homogenous mixing of the reaction mixture. The dependent claims disclose the type of fat or oil used as feed stock, the type of alcohol, the ratio of alcohol to oil, the catalyst type and the type of rector.

19. Applicant is directed to the discussion of Sucher as set out in paragraph 14 and the discussion of Peter et al. and Foidl in paragraph 15 above.

Sucher fails to disclose: pre-esterification of the free fatty acids to create a reaction mixture; that the alkyl ester functions as a subsidiary solvent that promotes homogeneous mixing; and the use of a heterogeneous catalyst.

20. However, with regard to the alkyl functioning as a subsidiary solvent that promotes homogeneous mixing, this feature is disclosed by Peter et al. and was disclosed by Foidl, to be a known occurrence when alkyl ester becomes part of the reaction mixture.

21. Further with regards to the use of a heterogeneous catalyst, Peterson et al. discloses this limitation as discussed in paragraph 16 above.

22. With regard to pre-esterification of the free fatty acids, Lever discloses that the free fatty acid in the fatty stock (fat/oil) can be reacted with a lower alcohol and a acid alcoholysis catalyst to reduce the free fatty acid content of the fat stock, then continuing

the transesterification process under alkaline conditions in the presence of a alkaline alcoholysis catalyst. (see page 2, lines 47-57).

All of the process steps of the claimed process are set out in Sucher, Peter, Lever and Peterson. Sucher teaches the transesterification process where alkyl ester is can be recycled into a continuous process as a reaction enricher in the process; Peter et al. teaches that a portion of the continuously produced methyl esters can be added to the transesterification process from a one phase homogeneous reaction mixture; Lever teaches that to reduce the free fatty acid content in the fat/oil a pre-esterification step can be incorporated as a reaction step in the process of preparing a fatty acid alkyl ester from a fat and/or oil having a high fatty acid content, then continuing through to transesterification; and Peterson et al. teaches the use of heterogeneous catalyst in a transesterification process for the production of diesel fuel. The only remaining differences are the range of alkyl ester returned to the transesterification process and the use of a batch reactor, a plug flow reactor or the use of a plurality of reactors. Each of these features is an old element common to the industrial transesterification process.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to prepare a biodiesel as suggested by Sucher in view of Peter et al. and further in view of Lever and Peterson et al. to produce a bio-diesel oil.

Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded

predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S., 82 USPQ2d 1385 (U.S. 2007).

With regard to any remaining limitations not disclosed in the prior art are deemed to be within the purview of an ordinary artisan. These limitations are deemed to be obvious absent a showing of unexpected results.

23. Claims 22 – 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sucher & Holzer Bauplan Handel (AT 406870B) (Sucher), in view of Peter et al. (WO 03/004591; US 6,933,398), in view of Peterson et al. (JAOCS, Vol. 61, 1984), and further in view of Foidl (US 5,939,571), as set out below. (Note that for Peter et al. all citations will be to the US patent which is the English language of the foreign reference)

24. The rejected claims cover, inter alia, a method of producing a bio-diesel oil, comprising: reacting a non-polar oil/fat selected from the group consisting of vegetable oil/fat, animal oil/fat, waste frying oil, regenerated oil/fat, and mixtures thereof, with a polar alcohol having from 1 to 10 carbons to create a reaction mixture that produces a reaction product, wherein the reaction product comprises a fatty acid alkyl ester consisting of the structure R_1COOR, wherein R and R_1 are independently selected, R is an alkyl group having from 1 to 10 carbons, and the structure R_1COOR has from 10 to 24 carbons; and, refluxing the fatty acid alkyl ester back to the reaction mixture, wherein the fatty acid alkyl ester composes 1% to 30% of the reaction mixture based on the weight of the non-polar oil/fat; wherein, the non-polar oil/fat and the polar alcohol are immiscible with each other in the reaction mixture in the absence of the fatty acid alkyl ester; the fatty acid alkyl ester functions to promote the formation of a homogeneous

mixture of the non-polar oil/fat with a polar alcohol in the reaction mixture in the absence of an agitator; the reacting of the non-polar oil/fat with the polar alcohol occurs at a higher rate of reaction in the presence of the refluxing than in the absence of the refluxing; and, the fatty acid alkyl ester does not have to be separated from the product after completion of the reaction. The dependent claims disclose the type of fat or oil used as feed stock, the type of alcohol, the ratio of alcohol to oil, the catalyst type and the type of rector.

25. Sucher discloses a process for producing a fatty acid alkyl ester by transesterification of triglycerides with an alcohol in the presence of a basic catalyst and is characterized by a combination of the following steps: (1) the triglyceride is mixed with the alcohol and catalyst and converted to form two fluid phases, namely, a crude ester phase and a glycerin phase; (2) the two fluid phases are separated; (3) the crude ester phase is divided into two portions (A) and (B); (4) portion (A) is purified, producing substantially pure fatty acid alkyl ester; (5) portion (B) is mixed with more triglyceride for transesterification, more alcohol and more catalyst and converted to form two further fluid phases, namely, a crude ester phase and a glycerin phase; steps (2) - (5) are then repeated. (abstract). The catalyst used in Sucher is a homogeneous catalyst which can be basic or acidic; the oil/fat can be selected from a vegetable oil or animal fat; the alcohols can be methanol of ethanol, and the process can be continuous. (see English translation (Eng. Trans) pages 2 & 3). The process of Sucher is a continuous process. (see Eng. Trans. Page 2, next to last sentence). Additonally, according to Sucher the reaction product crude ester portion (B), when recycled back into the transesterification

phase, the amount of alcohol and catalyst are lowered by enrichment of the reaction with the reaction product crude ester (B). (see ENG. Trans. page 3, para. 5). Further, the last two paragraphs on page 3 of the Eng. Trans. discuss the benefits of recycling a portion of reaction produce crude ester (B) back into the transesterification process that is continuous.

Sucher fails to disclose: that the reaction product has a structure R_1COOR has from 10 to 24 carbons; that the alkyl ester functions as a subsidiary solvent that promotes homogeneous mixing; the percentage range of alkyl ester put back into the reaction mixture; and the use of a heterogeneous catalyst.

26. However, the fatty acid alkyl esters of Sucher are produced from natural oils such as rapeseed oil which is known in the art to be made up of fatty acids containing C12 to C22 carbon atoms. As such, a fatty acid methyl ester prepared by process of Sucher from rapeseed oil would have a carbon atom number within the range of C10 to C24.

27. Further, with regard to the use of the alkyl ester to function as a solvent promoter, and the amount of ester placed back into the reaction mixture; Peter et al. discloses an identical use for the alkyl ester. Peter et al. is a process for obtaining fatty acid esters from triacylglycerides (triglyceride of biological origin) and recognizes that in a transesterification process there is a low reaction rate because the alkanol reaction component is not soluble in the oil. It is stated in Peter et al. that methanol is readily soluble in methyl ester. (see column 1, lines 66-67 to column 2, lines 1-7). The process of Peter et al. uses alkanol fatty acid esters such as, methyl esters, ethyl esters and/or

propanol esters, before, during or at the same time as addition of alcohol in the reaction process to accelerate the transesterification reaction, which is caused by the formation of a one phase reaction mixture. (see column 2, lines 33 – 38 & 50 - 54). The alkyl esters of Peter et al. are added in a quantity of 5 to 50 wt.% based on the fat and/or oil. (see column 3, lines 19-21). Specifically, the alcoholysis process of Peter et al., is carried out by using methanol, and adding a portion of the continuously produced ethyl esters to the triacylglyceride starting product in quantities such that the mixture of oil methanol and methyl esters consist of one reaction phase. (column 2, lines 60-64). Further, Peter et al. discusses recirculating alkanol fatty acid esters remaining after the reaction as part of a continuous operation. (see column 3, lines 57 - 67). Peter et al., without specifically stating such, is using the esters as solvent for the transesterification reaction process. Furthermore, based on the general discussion in Foidl, is was known at the time of Applicant's claimed process that esters once formed in a transesterification reaction between a triglyceride (fat/oil), alcohol and catalyst turn the initial biphase reaction into a homogeneous phase prior to the formation of the glycerin. (see column 3, lines 4-9).

It was known in the art that at the time of Applicant's claimed process that the addition of an alkyl ester to a transesterification reaction involving a fat and/oil would create a homogeneous reaction phase as disclosed by Foidl. Further, from the teaching of Peter et al. it is known that a homogeneous reaction phase, (one reaction phase) is formed when a portion of the continuously produced ethyl esters is added to the

triacylglyceride starting product before, after or at the same time the alkanol is added to the reaction.

Applicant's claimed process of producing bio-diesel oil (basically fatty acid methyl ester) by transesterification of oil/fat is disclosed by the combined teachings of Sucher and Peter et al., where each disclose that the addition of an alkyl ester product to the transesterification reaction offers an improvement to the reaction process. Foidl discloses that it was known that once the ester forms in the transesterification process a homogenous phase will exist. As such even though Sucher and Peter et al. do not specifically state the existence of a homogeneous phase, one of ordinary skill in the art would recognize the formation of the homogeneous phase because Foidl states that it was know to form. The only differences between the clamed invention and the references are the combination and order of the "old refining steps for the spent methanol and crude methyl ester" in the processing sequence. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to prepare a biodiesel as suggested by Sucher and add the additional step of adding alkyl ester from the reaction mixture as suggested by Peter et al. to promote homogeneous mixing of the reaction mixtures.

Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S. ___, 82 USPQ2d 1385 (U.S. 2007).

28. With regard to the use of a heterogeneous catalyst, Peterson et al. discloses that heterogeneous catalyst such as set out in Table II with catalyst activity set out in Table III. The reaction process used catalyst concentrations of 0.3-0.5% based on the weight of the vegetable oil. (see page 1593, column 2, first full paragraph). Peterson et al. teaches the use of heterogeneous catalyst in a transesterification process for the production of diesel fuel.

The only remaining differences are the use of a continuous stirred tank reactor or the use of a plug flow reactor. Each of these features is an old element common to the industrial transesterification process. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to prepare a biodiesel as suggested by Sucher in view of Peter et al. and further in view of Peterson et al. to produce a bio-diesel oil.

Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S., 82 USPQ2d 1385 (U.S. 2007).

With regard to any remaining limitations not disclosed in the prior art are deemed to be within the purview of an ordinary artisan. These limitations are deemed to be obvious absent a showing of unexpected results.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. *(In*

reOpprecht 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35USC 103(a). From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YATE' K. CUTLIFF whose telephone number is (571)272-9067. The examiner can normally be reached on M-TH 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel M. Sullivan can be reached on (571) 272 - 0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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